Cyclin D2 promoter, (SEQ ID NO:105) MSP primers
Accn. No. U47284 Promoter region analyzed: -1616 to -1394 bp

1 gagctCGagc caCGccatgc cCGctgcaCG tgccagcttg CGcagcacat cagggCGctg
61 gtctctcccc ttcctcctgg agtgaaatac accaaagggC GCGgtggggg tgggggtga
121 CGggaggaag gaggtgaaga aaCGccacca gatCGtatct cctgtaaaga cagccttgac
181 tcaaggatgC Gttagagca C GtgtcagggC CGacCGtgct ggCGgacttc acCGcagtCG
241 gctcccaggg agaaagcctg gcagagtgag gCGCGaaacC Ggagggt CGg CGaggatgCG
301 ggCGaaggac CGagCGtgga ggcctcatgc ctcCGgggaa aggaaggggt ggtggtgttt
361 gCGcaggggg agCGaggggg agcCGgacct aatccctcac tCGcccccc cccctccCGg
421 gccatttcct agaaagctgc atCGgtgtgg ccaCGctcag CGcagacacc tCGggCGgct
481 tgtcagcaga tgcagggCG aggaagCGgg tttttcctgC GtggcCGctg ggCGggggaa
541 cCGctgggag ccctgcccC Ggcctg CGgC Ggccctaga C GctgcacCGC GtCGccccac
601 gggcccCGaa gagcccccag aaacaCGatg gtttctgctC Gaggatcaca ttctatccct
661 ccagagaagc acccccccttc cttcctaata cccacctctc cctccctctt cttcctctgc
721 acacactctg caggggggg cagaagggaC Gttgttctgg tccctttaat CGgggctttc
781 gaaacagctt CGaagttatc aggaacacag acttcaggga catgaccttt atctctgggt
841 atgCGaggtt gctattttct aaaatcaccc cctcccttat ttttcactta agggacctat
901 ttctaaattg tctgaggtca ccccatcttc agataatcta ccctacattc ctggatctta
961 aatacaaggg caggaggatt aggatcCGtt ttgaagaagc caaagttgga gggtCGtatt
1021 ttggCGtgct acacctacag aatgagtgaa attagagggc agaaatagga gtCGgtagtt
1081 ttttgtgggt tgcctgtcCG gggcccctgg catgcaggct ggatggaggg agaggggtgg
1141 ggggtggCGg gggacCGCGt ttgaagttgg gtCGggccag ctgctgttct ccttaataac
1201 gagaggggaa aaggagggag ggagggagag attgaaagga ggaggggagg acCGggaggg
1261 gaggaaaggg gaggaggaac cagagCGggg aggCGCGggg agagggagga gagctaactg
1321 cccagccagc ttgCGtcacC Gcttcagag C Ggagaagag C Gagcagggga gagCGagacc
1381 agttttaagg ggaggacCGg tgCGagtgag gcagcccCGa ggctctgctC Gcccaccacc
1441 caatcctCGc ctcccttctg ctccaccttc tctctctgcc ctcacctctc cccCGaaaac
1501 cccctattta gccaaaggaa ggaggtcagg ggaaCGctct cccctcccct tccaaaaaac
1561 aaaaacagaa aaacccttt ccaggcCGgg gaaagcagga gggagagggg cCGcCGggct
1621 ggccatggag

FIG. 1A

MSP Unmethylated 223 BP

GT TATGTTATGT TTGTTGTATG **Forward UM 22 BP** MT 56 (SEQ ID NO:21)

T AAAATCCACC AACACAATCA **Reverse UM 21 BP** MT 56 (SEQ ID NO:22)

MSP Methylated 276 BP

TAC GTGTTAGGGT CGATCG **F M 19 BP** MT 58 (SEQ ID NO:23

CGA AATATCTACG CTAAACG **R M 20 BP** MT 56 (SEQ ID NO:24

MSP External primers 287 BP

TATTT TTTGTAAAGA TAGTTTTGAT EXT.F (SEQ ID NO:129)

TACAACTTTCTAAAAATAACCC EXT.R (SEQ ID NO:130)

FIG. 1B

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

FIG. 2A **Twist Promoter:** Accn No. AC003986 (SEQ ID NO:106)
Promoter Region analyzed: nts -51145 TO -51750

```
   1 cattggactg ggtttccttc cacCGaagag tgaacttctg cctctttCGa gcaccttcCG
  61 aggCGtagtc ctttggatgt tggggagCGt cagactgggt CGttgtagag gggaaaggag
 121 ggcccagaag ggCGagagag caggcCGgga CGcaaatcct cagccccCGC GgCGCGccaC
 181 Gtcttcagaa aCGccaggac ctcCGggctg ggcCGcCGCG gtttggcctt tggaactcaa
 241 gggttCGtct acctgaccat tgggtggctc CGCGgttgac acttttcttg gcatgccccc
 301 ccacccCGCG ccacaccacc cccccagccc cagcaatcca aatCGgcccc aCGgacctag
 361 agggctcttg ggCGagatga gacatcaccc actgtgtaga agctgttgcc attgctgctg
 421 tcacagccac tcCGgatggg gctgccacCG tggccaggac agtctcctcC GacCGcttcc
 481 tgggctgCGc tagggttCGg gggCGctgcc CGcaCGctcC GgCGgggaag gaaatCGccc
 541 CGCGccCGcC Ggaggaaggc GaCGgggagg gaagggggag gCGggctagg aggCGggtgg
 601 aggggcCGgc CGccCGggcc aggtCGtttt tgaatggttt gggaggaCGa attgttagac
 661 ccCGaggaag ggaggtggga CGggggaggg ggactggaaa gCGgaaactt tcctataaaa
 721 cttCGaaaag tccctcctcc tcaCGtcagg ccaatgacac tgctgccccc aaactttcCG
 781 cctgcaCGga ggtataagag cctccaagtc tgcagctctC Gcccaactcc cagacacctc
 841 gCGggctctg cagcacCGgc acCGtttcca ggaggcctgg CGgggtgtgC GtccagcCGt
 901 tgggCGcttt ctttttggga cctCGgggcc atccacacCG tcccctcccc ctccCGcctc
 961 cctcccCGcc tcccccGCGC GccctcccCG CGgaggtccc tccCGtcCGt cctcctgctc
1021 tctcctcCGC GggcCGcatC GccCGggcCG gCGcCGCGcC Gggggggaagc tggCGggctg
1081 aggCGcccCG ctcttctcct ctgcccCGgg ccCGCGaggc caCGCGtCGc CGctCGagag
1141 atgatgcagg aCGtgtccag ctCGccagtc tCGcCGgcCG aCGacagcct gagcaacagc
1201 gaggaagagc cagacCGgca gcagcCGcCG agCGgcaagC GCGggggaCG caagCGgCGc
1261 aCGagcaggC GcaCGgCGgg CGgCGgCGCG gggccCGgCG gagCGggtgg gggCGtCGga
1321 ggCGgCGaCG agcCGggcag ccCGgcccag ggcaaCGCGg gcaagaagtc tgCGggctgt
1381 ggCGgCGgCG gCGgCGCGgg CGgCGgCGgC Ggcagcagca gCGgCGgCGg gagtcCGcag
1441 tcttaCGagg agctgcagaC GcagCGggtc atggccaaCG tgCGggagCG ccagCGcacc
1501 cagtCGctga aCGaggCGtt CGcCGCGctg CGgaagatca tccccaCGct gccctCGgac
```

FIG. 2B

```
1561 aagctgagca agattcagac cctcaagctg gCGgccaggt acatCGactt cctctaccag
1621 gtcctccaga gCGaCGagct ggactccaag atggcaagct gcagctatgt ggctcaCGag
1681 CGgctcagct aCGccttctC Ggtctggagg atggaggggg cctggtccat gtcCGCGtcc
1741 cactagcagg CGgagccccc cacccctca gcagggcCGg agacctaggt aaggacCGCG
```

Unmethylated 193 BP

tt **TG**gatggggt tgttat**TGT** FUM (3) 21 BP AT 58 (SEQ ID NO:109)

c ctaacc**CA**aa **CA**ac**CA**acc RUM (3) 20 BP AT 60 (SEQ ID NO:110)

Methylated 200 BP

t tt**CG**gatggg gttgttat**C** FM (5) 20 BP AT 58 SEQ ID NO:107)

aaa**CG**ac ctaacc**CG**aa **CG** RM (4) 19 BP AT 58 (SEQ ID NO:108)

External primers 371 BP

Gagatgagatattatttattgtg EXT F (SEQ ID NO:131)

aacaacaatatcattaacctaac EXT R (SEQ ID NO:132)

FIG. 2C

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

RAR beta promoter, MSP primers ACCN NO. AF157483 (SEQ ID NO:91)
Promoter region analyzed: nt -196 to nt -357

```
   1 gtgacagaag tagtaggaag tgagctgttc agaggcagga gggtctattc tttgccaaag
  61 gggggaccag aattccccat gCGagctgtt tgaggactgg gatgcCGaga aCGCGagCGa
 121 tcCGagcagg gtttgtctgg gcacCGtCGg ggtaggatcC GgaaCGcatt CGgaaggctt
 181 tttgcaagca tttacttgga aggagaactt gggatctttc tgggaacccc cCGcccCGgc
 241 tggattggcC Gagcaagcct ggaaaatgca attgaaacac agagcaccag ctctgaggaa
 301 ctCGtcccaa gccccccatc tccacttcct ccccctCGag tgtacaaacc ctgcttCGtc
 361 tgccaggaca aatcatcagg gtaccactat ggggtcagCG cctgtgaggg atgtaagggc
 421 tttttcCGca gaagtattca gaagaatatg atttacactt gtcacCGaga taagaactgt
 481 gttattaata aagtcaccag gaatCGatgc caatactgtC Gactccagaa gtgctttgaa
 541 gtgggaatgt ccaaagaatc tgtcaggaat gacaggaaca agaaaaagaa ggagacttCG
 601 aagcaagaat gcacagagag ctatgaaatg acagctgagt tggaCGatct cacagagaag
 661 atcCGaaaag ctcaccagga aactttccct tcactctgcc agctgggtaa atacaccaCG
 721 aattccagtg ctgaccatCG agtcCGactg gacctgggcc tctgggacaa attcagtgaa
 781 ctggccacca agtgcattat taagatCGtg gagtttgcta aaCGtctgcc tggtttcact
 841 ggcttgacca tCGcagacca aattaccctg ctgaaggcCG cctgcctgga catcctgatt
 901 cttagaattt gcaccaggta taccccagaa caagacacca tgactttctc agaCGgcctt
 961 accctaaatC Gaactcagat gcacaatgct ggatttggtc ctctgactga ccttgtgttc
1021 acctttgcca accagctcct gcctttggaa atggatgaca cagaaacagg ccttctcagt
1081 gccatctgct taatctgtgg agacCGccag gaccttgagg aacCGacaaa agtagataag
1141 ctacaagaac cattgctgga agcactaaaa atttatatca gaaaaagaCG acccagcaag
1201 cctcacatgt ttccaaagat cttaatgaaa atcacagatc tcCGtagcat cagtgctaaa
1261 ggtgcagagC Gtgtaattac cttgaaaatg gaaattcctg gatcaatgcc acctctcatt
1321 caagaaatgc tggagaattc tgaaggacat gaacccttga ccccaagttc aagtgggaac
1381 acagcagagc acagtcctag catctcaccc agctcagtgg aaaacagtgg ggtcagtcag
1441 tcaccactCG tgcaataaga ca
```

FIG. 3A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

Unmethylated 163 BP

ggattgg gatgt **TG**aga a**TGT** FUM 21 BP AT 60 (SEQ ID NO:92)

C Aaccaatcca ac**CA**aaa**CA**a RUM 21 BP AT 60 (SEQ ID NO:93)

Methylated 142 BP

ga a**CGCG**ag**CG**a tt**CG**agt FM(2) 19 BP AT 60 (SEQ ID NO:135)

Gaccaatcca ac**CG**aaa**CG** RM(2) 19 BP AT 58 (SEQ ID NO:136)

External primers 266 BP

gtaggagggtttattt tttgtt EXT (2) F (SEQ ID NO:133)

aattacattttccaaacttactc EXT 4 (2) (SEQ ID NO:134)

FIG. 3B

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

Homo sapiens serine protease-like protease (nes1) mRNA, complete cds ACCESSION AF024605
(SEQ ID NO:94)

```
   1 accagcggca gaccacaggc agggcagagg cacgtctggg tcccctccct ccttcctatc
  61 ggcgactccc agatcctggc catgagagct ccgcacctcc acctctccgc cgcctctggc
 121 gcccgggctc tggcgaagct gctgccgctg ctgatggcgc aactctgggc cgcagaggcg
 181 gcgctgctcc cccaaaacga cacgcgcttg gaccccgaag cctatggcgc cccgtgcgcg
 241 cgcggctcgc agccctggca ggtctcgctc ttcaacggcc tctcgttcca ctgcgcgggt
 301 gtcctggtgg accagagttg ggtgctgacg gccgcgcact gcggaaacaa gccactgtgg
 361 gctcgagtag gggatgatca cctgctgctt cttcagggcg agcagctccg ccggacgact
 421 cgctctgttg tccatcccaa gtaccaccag ggctcaggcc ccatcctgcc aaggcgaacg
 481 gatgagcacg atctcatgtt gctaaagctg gccaggcccg tagtgccggg gccccgcgtc
 541 cgggccctgc agcttcccta ccgctgtgct cagcccggag accagtgcca ggttgctggc
 601 tggggcacca cggccgcccg gagagtgaag tacaacaagg gcctgacctg ctccagcatc
 661 actatcctga gccctaaaga gtgtgaggtc ttctaccctg gcgtggtcac caacaacatg
 721 atatgtgctg gactggaccg gggccaggac ccttgccaga gtgactctgg aggccccctg
 781 gtctgtgacg agaccctcca aggcatcctc tcgtggggtg tttacccctg tggctctgcc
 841 cagcatccag ctgtctacac ccagatctgc aaatacatgt cctggatcaa taaagtcata
 901 cgctccaact gatccagatg ctacgctcca gctgatccag atgttatgct cctgctgatc
 961 cagatgccca gaggctccat cgtccatcct cttcctcccc agtcggctga actctccct
1021 tgtctgcact gttcaaacct ctgccgccct ccacacctct aaacatctcc cctctcacct
1081 cattccccca cctatcccca ttctctgcct gtactgaagc tgaaatgcag gaagtggtgg
1141 caaaggttta ttccagagaa gccaggaagc cggtcatcac ccagcctctg agagcagtta
1201 ctggggtcac ccaacctgac ttcctctgcc actccccgct gtgtgacttt gggcaagcca
1261 agtgccctct ctgaacctca gtttcctcat ctgcaaaatg ggaacaatga cgtgcctacc
1321 tcttagacat gttgtgagga gactatgata taacatgtgt atgtaaatct tcatgtgatt
1381 gtcatgtaag gcttaacaca gtgggtggtg agttctgact aaaggttacc tgttgtcgtg
1441 aaaaaaaaaa aaaa
```

FIG. 4A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

Sequence analyzed: nts +169 to +349
Exon 3 sequence (SEQ ID NO:95)

cCGcagaggC GgCGctgctc ccccaaaaCG acaCGCGctt ggaccCGaa gcctatggCG cccCGtgCGC GCGCGgctCG cagccctggc aggtctCGct cttcaaCGgc ctctCGttcc actgCGCGgg tgtcctggtg gaccagagtt gggtgctgaC GgcCGCGcac tgCGgaaaca a

FIG. 4B

Unmethylated 128 BP

tTGtagaggT GgTGttgttt Nes1 FUM 20 BP AT 56 (SEQ ID NO:77)

CACAcaat aaaaCAaaaa acCA Nes1 RUM 22 BP AT 56 (SEQ ID NO:78)

Methylated 137 BP

ttCGaa gtttatggCG tttC Nes 1 FM 20 BP AT 56 (SEQ ID NO:79)

t tatttcCGca ataCGCGac Nes1 RM 20 BP AT 58 (SEQ ID NO:80)

FIG. 4C

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

HOX A5 Promoter 3′ to 5′ AC004080 (SEQ ID NO:96)

16321 accaagagag actgggagag ggCGgcagag aagagagggg ggacCGagag cCGCGtcccc
16381 gCGgtCGCGt ggatttagaa aaaggctggc tttaccatga cttatgtgca gcttgCGcat
16441 ccaggggtag atctggggtt gggCGggCGg CGcCGggctC GgctCGctct gCGcactCGc
16501 ctgctCGctg ctggcagggg CGtcctcctC GgctcCGgaC GcCGtgccaa ccccctctct
16561 gctgctgatg tgggtgctgc CGgCGtCGgc CGaggCGcCG ctggagttgc ttagggagtt
16621 tttccCGcCG tggtggctgt CGctgcCGgg CGaggggccc aCGgCGgagc agggcagCGg
16681 atCGggctga ggagagtgCG tggaCGtggc CGgctggctg tacctgggct CGgCGggCGc
16741 CGCGctggCG ctggcagCGt agctgCGggC GCGctctcCG gagccaaagt ggcCGgagcc
16801 CGagCGgcCG aCGctgagat ccatgccatt gtagcCGtag cCGtacctgc CGgagtgcat
16861 gctCGcCGag tccctgaatt gctCGctcaC Ggaactatga tctccataat tatgcaactg
16921 gtagtcCGgg ccatttggat agCGacCGca aaatgagttt acaaaataag agctcatttg
16981 ttttttgata tgtgtgcttg atttgtggct CGCGgtCGtt tgtgCGtcta tagcaccctt
17041 gcacaattta tgatgaatta tggaaatgac tgggacatgt acttggttcc ctcctaCGta
17101 ggcacccaaa tatggggtaC Gacttcgaat caCGtgcttt tgttgtccag tCGtaaatcc
17161 tgcctgatga cctctagagg taaactCGtg cactaatagg ggagttgggt ggaggCGagg
17221 ggggtggCGC GCGCGcccCG ggCGCGtgcc CGcCGccagt tgcCGcCGtt cagcCGgact
17281 CGagCGccac cCGctggagg cagggctcat CGcccagctt cCGacCGggg gctgcaaggg
17341 cCGgggtCGa attgaggtta cagcccatta tggcaaaatt attgcatttc cctCGcagtt
17401 ccattaggat gtaccaattg ttaggcCGtc agctgcCGat CGCGCGccCG gCGaggatgc
17461 agaggattgg

FIG. 5A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

Complement- 5′ to 3′ Promoter region analyzed: nts -97 to nts -303

(SEQ ID NO:97)

ccaatcctct gcatcctCGc CGggCGCGCG atCGgcagct gaCGgcctaa caattggtac atcctaatgg aactgCGagg gaaatgcaat
aattttgcca taatgggctg taacctcaat tCGacccCGg cccttgcagc ccCGgtCGg aagctgggCG atgagccctg cctccagCGg
gtggCGctCG agtcCGgctg aaCGgCGgca actggCGgCG ggcaCGCGcc CGgggCGCGC GCGccacccc.cctCGcctcc acccaactcc
cctattagtg caCGagttta cctctagagg tcatcaggcaggatttaCGa ctggacaaca aaagcaCGtg attCGaagtC Gtacccata
tttgggtgcctaCGtaggag ggaaccaagt acatgtccca gtcatttcca taattcatca taaattgtgc aagggtgcta tagaCGcaca
aaCGacCGCG agccacaaat caagcacaca tatcaaaaaacaaatgagct cttattttgt aaactcattt tgCGgtCGct atccaaatgg
ccCGgactac cagttgcata attatggaga tcatagttcC Gtgat CGagc aattcaggga ctCGgCGagc atgcactcCG gcaggtaCGg
ctaCGgctac aatggcatgg atctcagCGt CGgcCGctCG ggctcCGgcc actttggtct CGgagagCGC GccCGcagct aCGctgccag
CGccagCGCG gCGccCGcCG agccCaggta cagccagcCG gccaCGtcca CGcactctcc tcagccCGat

FIG. 5B

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

UnMethylated 213 BP

tTGgtTGg aagttgggTG **FUM 18 BP** AT 56 (SEQ ID NO:71)

gtaTGtg attTGaagtT Gtat (SEQ ID NO:98)

aataC AacttCAaat caCAtac **RUM 22 BP** AT 56 (SEQ ID NO:72

Methylated 183 BP

tttagCGg gtggCGttCG **FM 18 BP** AT 58 (SEQ ID NO:69)

taCGtg attCGaagtC Gtat (SEQ ID NO:99)

ataC GacttCGaat caCGta **RM 20 BP** AT 56 (SEQ ID NO:70)

FIG. 5C

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

Sequencing 307 BP

attttgtta taatgggttg taat Hox A5 Seq. F 23 BP AT 56 (SEQ ID NO:73)

ggag ggaattaagt atatgtt (SEQ ID NO:100)

aacatat acttaattcc ctcc Hox A5 Seq.R 21 BP AT 56 (SEQ ID NO:74)

Expression 248 BP

tcattt tgcggtcgct atcc Hox Exp F 20 BP AT 60 (SEQ ID NO:75)

ccaggta cagccagccg gc (SEQ ID NO:101)

gc cggctggctg tacctg Hox Exp R 18 BP AT 62 (SEQ ID NO:76)

FIG. 5D

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

Homo sapiens 14-3-3 sigma protein promoter and gene, complete cds.
ACCESSION No. AF029081 (SEQ ID NO:102)

```
   1 ggatcccagc ctgcccctcc acttctctcc caagccaggt cccggcatgg gtgggttatg
  61 ctcatgctgg caatacttga aacgggttta ttaatgctgg gtattttgca caattttata
 121 gacctctttt ctacatagtc ttttttaaat ggaaggagaa aatgtcagcc acattactgt
 181 ctgtgtagtg ccaggtgaag ggttatcaga aggctggttg gttttaataa gtttattcca
 241 agagaccttc tggctggaat gagtgagagt gtgtgtgcat gtgtgtgtgt gttcatgtgt
 301 gccctgtatg aatgtggctg gctcccagat cccctgggct gccccctgcc ccatcccctt
 361 tgagtatcag aagcactctg agccaagggg acaggggggca cgtgcactgg tcacgagaaa
 421 accctgggct cccactgggg ctcagcccag cctcctatct ttccttcttc tatggacttc
 481 agacagccag tgtctgggga ctctgccact ctacccccag ccctacccac cagcccccag
 541 gtgaggcttc cagctgggac ctgcccagac aggctgagcc tgggcgtggt gggtggggtg
 601 atggctctgg ggagcggctg ccatcctaca agccacaccc cctcctctga gctctgaata
 661 tgggacccag tgccaggagc tggaagacaa ggtgtttctg ccaaacggga cctccatcca
 721 gagaaaagga agaaggtgca gggtgggcca agaggcaagt gaaggttggc ctgagtctgg
 781 gccggaaact cagaggatgt ttctcctctg ctgggagctg tagtttctta tcaaaataga
 841 tattgttcca ccatcccccct ccttggccct tcaagtgggc tgaagccttg gaaagtgaca
 901 taggaagtcc ccagatcttg cccttctcac tccagaggct agtggtcaca gacagctggg
 961 aatggcagcc acagagggtc cctctggaga aacagcttca ccccagcctc agggccctgg
1021 gcatcactgc agtggccctg ggaggtgagg aagaagctgg ctagaggagg gggctcccac
1081 ctacctttta tttaagccag tattctttgt tcctgcttgt aataaaactt cagtttataa
1141 gagttgcttt gctttggttt ggtttttgtt tgcttttcct ttgctgaggc cccaactggg
1201 agccctctgt tctttcagac aaatttggtt ctttcctggg gagactgtga gaaggcaggc
1261 agcccagtga tctggctaca ttttccctca cctggctgga gctctgtccg ctggaggaag
1321 agcagagagg gctgcggctg agcccccatg ggcacgtgaa aagaggccat cctgtcccct
1381 ctttgtcccc tccaccttcc cctgcctcag gggcttggag accccaaatt cttcttccct
1441 actgcctttc cactccgatc cccaatgagt gcccagctaa gaaaatgttt gagacagtag
1501 attccagttt gagagccgga gcttccctgg ctaccacctc caacctgggc accagggccc
1561 agccagacaa ctcataacac tggcccacct ctctggtatc tccctcagga ggacacctgt
```

FIG. 6A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

FIG. 6B

SEQ ID NO:102 CON'T)

```
1621 caggattttg ccatctcctg cacagcctga ggggagctaa caggcctctt tgcagagggt
1681 tagctggtaa gaccgtttct tccctgtcgg ccagcactgc ccgctcccct ccacacacca
1741 tctcatcctc atcgcatgcc tcgccaaccc catggagccc gtccatctgt ctggtgtgtg
1801 gtgcggtgtg tgtgctggtg gtggtagggt ctccagggac tccccgctaa gcagaaggat
1861 cgggatatag ggcaaggcta aaagcccagc cccattgtgg actgaggaag tacgttcgcg
1921 cagagcagct ctccagctgg aagaggaggt ggagggtgag gctggggaga ggatggcgaa
1981 cctgccctga ggtgcttggg tctgtgctgg tggggtcctg gtatgcaggg gccaccggtc
2041 actaacactc ttatgtcctg gctttctgtc cccgctgagc tttctctcac ccgcccgttt
2101 tctctcctgc ttcattgcct gctgcctaag ccttggccct tctctcgggc agaggcaggt
2161 gctgtggcag cacctctccc caccaccggg cccctgcagg ccgcctccct cctcccaggc
2221 ctgctaaccc tctctcttct ccttctttgc tgtcctgccg gggatctcca gtgtgtgcgg
2281 gggcttaagg acctcctgag gaccgctgct ctctgcctct ccaggaatgg cctgggggga
2341 gccaggcacc cggcacctcc acctgcctaa cctgtggccc atctgccacc atctgtgcct
2401 acagggtctg ccccccagcc tgcccggcct gtgtgctctc taggacccca taggggggcag
2461 gggctggcct ctttgcccca ttcccgctcc atgccggcca gagtgtagaa agccataacg
2521 cacgcagcca tcagcacaat aatgtgactc tacgctgata tgctccctct ctcctccact
2581 gacttccccct tcccggattt gtgaggtgtc aagactagga atctggcctt agagcctgcc
2641 cctccacccc ctcagatcag gcatagccat agtcaagccc agcaggtttc ctcaggagct
2701 gtctggggtg ttgatggtgg atgacgctgc tgaacaagtt tggtgactgt tctaagcaca
2761 actggcttga tactgttccc acggcctgtc cacctcccac ccccaaccct ccaccagagt
2821 aggtaggatg tagggagggt gcgtgccgcc tttgctctag gcactgaggg accaagctag
2881 ccgtgcacag ccccatacac ttcaggggcg taaaggaaag agctgagcca aggaaaatca
2941 gctgagccca gggctggggg ctgcttgtct gctatcctgt acctttttt ttttaacca
3001 aaataaagat tcccctcttc ttgccatacc attggctgtc tggtggcgcc tttactttgg
3061 ggcccaggga tgggacctgc agtgggcgtg tggaacatat ggctcccct cgctcccagc
3121 tttcttccag ctggccagtg ctgctctgga gatttacaag cacaacgaag ccaggaggga
3181 cacaggaaaa gtggctgaca tccttttcac tctgcccctc cagaactctt ggtctcaatt
3241 ccagacacca cccagcctta gctgacctct ggattctgat aggtcccagt gcaggctgag
3301 acagagggtt taactccagt ttgggactgc catacccatg aactgagccc agcccagggt
3361 aacgatctca tggaaacttc tctctcccca gttgctgcac tacatcaaga tacacacatg
3421 tgcatacact gtactatggg ctaaaaaaat acgtaccgct accgttcagc aagggcttgc
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Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
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Atty. Docket No.: JHU1630-1

FIG. 6C

(SEQ ID NO:102 CON'T)

```
3481 cgagtcccgg gcccattttc tcatcttaac ctgtgaggag gatgatgtca gccttttttac
3541 agatgaggga actgagactc aaggaagaaa caggagctgc ccaaggtcac ccagctggca
3601 aagcagcaaa tcccagatcg gaacctgatc tctgccccga gctctgagcc atctgcacta
3661 cccaaggaat gaatacagcg gtgggaggat gagatcttgg agaaacccta aaattagaga
3721 atgtcatagc cagtagaggg cttagagttg atctgggcca gcctccttgt tttactgatg
3781 gagaaattga agcccagagg caggaaggga cctgcccaag gccttataac agagctggga
3841 tgcagtccca cactctgacc tcattccatt ctctctccat aaattctgca ctgtctctag
3901 actggactgg tttagatgtg ggatactcta aacagcagtg ccttcaagag aaaaagaatc
3961 agaactacga atcacttaaa agtaatgtaa gctactctgg gcacactgcc tatggggtcg
4021 ccctgctcca caaggagcca caaaaataat taaaataatt taatatccct tcccaaaggt
4081 aaccagtaaa gtaagctctt ggctaggtaa ctggactctt gttcacaact agccagtggg
4141 aaaaggtgct agagcttcct ctggccacct gtttaatttg atcattccaa gacagaaaca
4201 tttcttagga agttctttct agaatctacc tggtgtccct cccactgcta tcagagccct
4261 gtcctctgtc ctcagtggag gtagagagca aatggttgct gctttcttca tcacaaccct
4321 tcaaagccta ttattaccag ctaagaagga ttggttgact atgggccaga gcccctgagc
4381 ctgctggtag aatggatgct gtacaggagg gtggggaggt agcaggcaga atgaggaaag
4441 ccccttttgag ctgcaacccc agctcctgtc ctgctgactc agacagctga ctgtggagct
4501 ccatgccctg ccagggcctg ctgcctcctg cccgtctgag ctcctgaact tgggaaatgg
4561 aggcccagag gcaaagggag gtacctgaga caggaactga gtcaggatca acaggccaga
4621 gcgggcagga ggtatcaggc agcctggctc ccagatgcac ccctgagctc cagcagggga
4681 ggagtaggaa tgaaggggct tccttgccct tgctcatggc tatgcggagg gcgtgaacca
4741 ccaccaggtc ctctggctta agtggcggga agcaaatggt ccctccctgg actcaggctc
4801 caaagttcct gggcctgcct tccaggttcc cagtgtcctg ggatctccag ctttccccag
4861 gacttgggga agccccggct ggatgactag tacaaatgaa ggcccctgag gttccaggac
4921 ctgctgaggt cacaggaata tcctagatca agcttgtcca acccacggcc cacaggctgc
4981 atgtggccca gaatggcttt gaatgcagcc caacacaaat tagtaaactt tcttaaaaca
5041 ttatgagatt tttttgcaaa tttttttttt ttttttagct catcagttat tggtagtgtt
5101 ggtatatttt atgtgtggcc caagacaatt cttccaatgt ggcccaggga agccaaaaga
5161 ttggacacgc ctgtcctaga tggagaggaa ggaggcagtg ctgagcacat ctggccattc
```

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
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FIG. 6D

(SEQ ID NO:102 CON'T)

5221 atccatctgg agagagaagg ctatgggcaa actgcttcct ctcccctgta gacacccagc
5281 tgggaaggtc tggcctttgg taagtcctgg cttggggtcc ttcctcattt cacagaacct
5341 aactctatgt tagtgctttg tgagtatatg ttgatcataa taaagttgac gggatttttt
5401 cacatgataa taatagttgt catctggccg ggcatggtgg cttatgccta taatttcagc
5461 actttggaag gctgaggcag gtggatcact tgaggtcagc tgttcgagac cagcctggcc
5521 aacatggtga aaccacatct ctacttaaaa aaaaaaaaaa tacaaaaatt agctgggtgt
5581 ggtggtgcac ccttgtaatc ccagctactc gggaggctga ggcaggagaa tcacttgaac
5641 ccaggaggtg gaggttgcag tgagctgaga ttgtgccact acactccagc ctgggtgaca
5701 agagcgaaac tccgtctcaa aaaaaaagaa aataataata ataatagttg ccatccattc
5761 tactgtgctt tccattaact cgtgtaatcc tcacaagtcc cattttatag ttacaggaac
5821 tgaggctcac agagcttaaa tcacttggcc aaggccacaa acagctataa gaattacatt
5881 taggcagtct gattccaaag atactagtct attctgtatc tcatagacaa acaatacata
5941 ttcacttttt tgttgttgtt ttgttttgag acggagtctt gctctgtcac ccaggctgga
6001 gtgcagtggc gccatctcgg ctcactgcaa cgtccgcctc ccgggttcaa gcgattctcc
6061 tgcctcagcc tcccgagtag ctgggactac aggcatgtgc caccatgccc ggctaatttt
6121 ttgtattttt agtagagaca gggttttcct gggttagcca gaatggtctc gatctcctga
6181 ccttgtgatc cacccacctc agcctcccaa agtgctgaga tgacaggcgt gagccaccgc
6241 gtccgaccta tattcactat ttataaattg gagagaataa gaaaatcaaa agggccaggt
6301 gtagtgactc acacctgtaa tcccagcact ttgggaagcc aaggcaggag gattgcttga
6361 acccagaagt tcgagaccag cctgggcaac atggtgagac cctgtctcta caaaaaatac
6421 aaaaattagc tgggcgttgt ggtgagcacc ttattcttag gaagctgagg caggaggatc
6481 acctgaggcc aaggaggttg agactgcagt gagctgtgat cataccactg tacttcagcc
6541 tggacatcag agtaagaccc tatctctaaa aaggaaattg agaagaaaga aaatcaaagg
6601 gaagcaaaat cactcactct cactacctca agataccctc tagaagttgg tattttagtg
6661 tggttcctat tgttttctgt gtcagttctc tgatttgagc aaaatctttg ggacgtcaaa
6721 cttaaaatcc cctttacttc cttggaaacc ctgtagcatt agcccagaca tgtccctact
6781 cctccttgtg gcaaagagaa ggatctcgtc tttggtcccc agagttctgg cctaagcctc
6841 cctccaggag ggaagatgag tgttcagaca ctcagagtag ctgggggaga cacaggcctg
6901 tgaaattatc ctggctcaac tattaggtcg gcagaatccc agtgaaggga gccctacctc
6961 tgagccccat ctaagctttg gctatgggtg gggcagataa gcaggaatcc atccctatag

FIG. 6E

(SEQ ID NO:102 CON'T)

7021 gctcaatgcc aacaccctta ggtgaaactc ttgatgaaac ttgaggccag ggctccggca
7081 agcagggaaa gaacgttggc aacagaggtc tccatctctg aggactctgc caggggtcag
7141 agatggggca atggtcaaaa ggaaggaaca ggccaggcac agtggctcat gcccataatc
7201 ccagcacttt gggaggctga ggcaggagga tcgcttgagc ccaggagttt gagacctgcc
7261 tgggcaatgt agtgagatct gctctctatt taaaaaaaaa aaaaaggaaa gaacaagtaa
7321 acttctgaga aacaggctgg gggaggcatc acgtagctgg aattgctgcc ccataaaaca
7381 gaatggtatg tgtcactgcc acctcccttt ctcagtcctc tctctcccca ggttgctagc
7441 gtccccctgg gggatcaaac tggactgctt cccagcctca gacagagagc agtctgagtc
7501 aggcaggaaa gtgggacagc cggggagctg gaccccaccc tctgtgagcc ccgctggtac
7561 ctgatggcat gtggcttgga gagggcaggt gacctggcgt ggagggccag agggtaaatc
7621 ctcaaacaag tggcaacagg ccaccaactt gaaagggaaa attgtgtagt gatgggaaat
7681 gtgtccaaca aacctactgg gtgactaatt acaaaggctg ggctggagct tcagaggctg
7741 cttgttaaac acttcattaa gcggcactct gaaagctgcc acctgcgcat tctgggagct
7801 cagaggggac cctgaggggg aatgaggcct ggaggatgga accatcttca ggtagactga
7861 gaaggagcct ggatctcact tccaaacaca gtctggagct cataggtcag aggcctcaat
7921 gggagaaaag ctaaaggaag agggtgcaga aaggagtttc agggaattgg tggctatgtg
7981 actttgagca aatctcaccc ctctctgaga cttagtgttc ccatctctat ggtcctgtgt
8041 gtgtcacaga gacatggtgg ggattaaatt cgatcgtgat atgaaagtgc ttgggaaact
8101 ccatggccct acctaaacat gagttatcct cacctgaacc aaggggggaa gttacctggc
8161 aggattagga accccatcct cctgaacctt tatgggctct gtcgaggctg aagcagccag
8221 gggctaaagc cagtccttag cccctggaag ggcactgtga aagtggatct gatttgagaa
8281 gccgtttcct gatgtgggca gccatgtgat gccagccccg aacaagaggg ggcagcctgg
8341 agcctggaaa ggtgccagtg caggtggggc ccacgcccag atttctcctg ctgactgttc
8401 tgatgattca cccccacatc ccagcctttt taccttttact gcagagccgg aaagggtgtg
8461 gggaagagag gagagggagg caggtcttgg gccctggtcc cgcccccctgc tcctccccac
8521 ccttctctgg gcctggccac ccagccaaaa ggcaggccaa gagcaggaga gacacagagt
8581 ccggcattgg tcccaggcag cagttagccc gccgcccgcc tgtgtgtccc cagagccatg
8641 gagagagcca gtctgatcca gaaggccaag ctggcagagc aggccgaacg ctatgaggac
8701 atggcagcct tcatgaaagg cgccgtggag aagggcgagg agctctcctg cgaagagcga

FIG. 6F

SEQ ID NO:102 (CON'T)

```
 8761 aacctgctct cagtagccta taagaacgtg gtgggcggcc agagggctgc ctggagggtg
 8821 ctgtccagta ttgagcagaa aagcaacgag gagggctcgg aggagaaggg gcccgaggtg
 8881 cgtgagtacc gggagaaggt ggagactgag ctccagggcg tgtgcgacac cgtgctgggc
 8941 ctgctggaca gccacctcat caaggaggcc ggggacgccg agagccgggt cttctacctg
 9001 aagatgaagg gtgactacta ccgctacctg gccgaggtgg ccaccggtga cgacaagaag
 9061 cgcatcattg actcagcccg gtcagcctac caggaggcca tggacatcag caagaaggag
 9121 atgccgccca ccaaccccat ccgcctgggc ctggccctga acttttccgt cttccactac
 9181 gagatcgcca acagccccga ggaggccatc tctctggcca agaccacttt cgacgaggcc
 9241 atggctgatc tgcacaccct cagcgaggac tcctacaaag acagcaccct catcatgcag
 9301 ctgctgcgag acaacctgac actgtggacg gccgacaacg ccggggaaga gggggcgag
 9361 gctccccagg agccccagag ctgagtgttg cccgccaccg ccccgccctg ccccctccag
 9421 tcccccaccc tgccgagagg actagtatgg ggtgggaggc cccacccttc tcccctaggc
 9481 gctgttcttg ctccaaaggg ctccgtggag agggactggc agagctgagg ccacctgggg
 9541 ctggggatcc cactcttctt gcagctgttg agcgcaccta accactggtc atgccccCac
 9601 ccctgctctc cgcacccgct tcctcccgac cccaggacca ggctacttct cccctcctct
 9661 tgcctccctc ctgcccctgc tgcctctgat cgtaggaatt gaggagtgtc ccgccttgtg
 9721 gctgagaact ggacagtggc aggggctgga gatgggtgtg tgtgtgtgtg tgtgtgtgtg
 9781 tgtgtgcgcg cgcgccagtg caagaccgag actgagggaa agcatgtctg ctgggtgtga
 9841 ccatgtttcc tctcaataaa gttcccctgt gacactcctc ctgtctctct tccagttctt
 9901 ggcgatgggc tgggagtggg actggaatct gacttagaga ccctgacttt ggacctctga
 9961 gttagggccc tgaactccct aggtggctca gtggcccgca cgcaagactt tgagtccagg
10021 tgaggccggg gtcc
```


Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

H.sapiens Wilms tumor (WT1) gene promoter. ACCESSION No. X74840
(SEQ ID NO:103)

```
   1 agcttgcagc cccagcccgg gccagccagg tacaggaggc cggactgcaa ccggttgctt
  61 ccctcccgtc gcgcctggcc gtcccacgct gcgccgtcgc tgctgcctcc tggcgccccc
 121 gggatttttat acgcacctct gaaacacgct ccgctccggc ccccggttct tctccttgcc
 181 taggggttgt ttcccaatag atactgactc ctttagaaga tccaaaaacc aaaccaaaac
 241 acccccctacc cgccccaaac acctgctctg gggcgcgggg gctgccaaac agagactaga
 301 cgaagggagt cagatttagc gaantcttcg agctcccaaa gattcgaaca ctaactcgcg
 361 cccgtgggcc gatggaggtt ctccctactc cactccttgg tcccccttaac tggcttccgc
 421 ctcctggtca atcactgagc aaccagaatg gtatcctcga ccagggccac aggcagtgct
 481 cggcggagtg gctccaggag ttacccgctc ctgccgggct tcgtatccaa accctccccct
 541 tcacccctcc tccccaaact gggcgccagg atgctccggc cggaatatac gcaggctttg
 601 ggcgtttgcc caagggtttt cttccctcct aaactagccg ctgttttccc ggcttaaccg
 661 tagaagaatt agatattcct cactggaaag ggaaactaag tgctgctgac tccaatttta
 721 ggtaggcggc aaccgcttcc gcctggcgca aacctcacca agtaaacaac tactagccga
 781 tcgaaatacg cccggcttat aactggtgca actcccggcc acccaactga gggacgttcg
 841 ctttcagtcc cgacctctgg aacccacaaa gggccacctc tttccccagt gaccccaaga
 901 tcatggccac tcccctaccc gacagttcta gaagcaagag ccagactcaa gggtgcaaag
 961 caagggtata cgcttctttg aagcttgact gagttctttc tgcgctttcc tgaagttccc
1021 gccctcttgg agcctacctg cccctccctc caaaccactc ttttagatta acaaccccat
1081 ctctactccc accgcattcg accctgcccg gactcactgc ttacctgaac ggactctcca
1141 gtgagacgag gctcccacac tggcgaaggc caagaagggg aggtgggggg agggttgtgc
1201 cacaccggcc agctgagagc gcgtgttggg ttgaagagga gggtgtctcc gagagggacg
1261 ctccctcgga cccgccctca ccccagctgc gagggcgccc ccaaggagca gcgcgcgctg
1321 cctggccggg cttgggctgc tgagtgaatg gagcggccga gcctcctggc tcctcctctt
1381 ccccgcgccg ccggcccctc ttatttgagc tttgggaagc tgagggcagc caggcagctg
```

FIG. 7A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
Applicants: Sukumar et al.
App. No.: 10/059,579 Filed: 01/28/2002
Atty. Docket No.: JHU1630-1

(SEQ ID NO:103 CON'T)

```
1441 gggtaaggag ttcaaggcag cgcccacacc cgggggctct ccgcaacccg accgcctgtc
1501 cgctccccca cttcccgccc tccctcccac ctactcattc acccacccac ccacccagag
1561 ccgggacggc agcccaggcg cccgggcccc gccgtctcct cgccgcgatc ctggacttcc
1621 tcttgctgca ggacccggct tccacgtgtg tcccggagcc ggcgtctcag cacacgctcc
1681 gctccgggcc tgggtgccta cagcagccag agcagcaggg agtccgggac ccgggcggca
1741 tctgggccaa gttaggcgcc gccgaggcca gcgctgaacg tctccagggc cggaggagcc
1801 gcggggcgtc cgggtctgag cctcagcaaa tgggctccga cgtgcgggac ctgaacgcgc
1861 tgctgcccgc cgtcccctcc ctgggtggcg gcggcggctg tgccctgcct gtgagcggcg
1921 cggcgcagtg ggcgccggtg ctggactttg cgcccccggg cgcttcggct tacgggtcgt
1981 tgggcggccc cgcgccgcca ccggctccgc cgccaccccc gccgccgccg cctcactcct
2041 tcatcaaaca ggagccgagc tggggcggcg cggagccgca cgaggagcag tgcctgagcg
2101 ccttcactgt ccacttttcc ggccagttca ctggcacagc cggagcctgt cgctacgggc
2161 ccttcggtcc tcctccgccc agccaggcgt catccggcca ggccaggatg tttcctaacg
2221 cgccctacct gcccagctgc ctcgagagcc agcccgctat tcgcaatcag ggtaagtagg
2281 ccggggagcg ccccta
```

FIG. 7B

Estrogen Receptor (ER): Homo sapiens estrogen receptor beta gene, promoter region and Partial cds (SEQ ID NO:104) Accession Number AF191544

```
   1 actatagggc aCGCGtggtC GaCGgccCGg gctggtattg atagatgcat tttcttcacc
  61 ctcacctatc tttttctgcc tgttggctta tggttgaaat tccttcatga CGgtttccat
 121 ttccagagat atcttgttaa caagtatata ccaccaaatg aagctgattt ttttttttt
 181 tttttttga gacagagtct CGctctgtCG cccaggctgg aatgcagtgg CGCGatcttg
 241 gctcactgca acctcCGcct cccatgttca agCGattctc ctgcctcagc ctcctgagta
 301 gctgggatta ctggcatgtg ccacCGCGtc cagccaattt ttgtattttt agtagagaCG
 361 aggtttcacc atgttggtca ggctggtctc aaactcctga cctCGtgatc cacctgcctc
 421 ggcctcccaa agtgctgaga ttataggtgt gagccaccat gcctggccat gaagctgatt
 481 tttttaaacc atcatttaac attttctcca taaggtggca aggaggaaga gcatatgggg
 541 actgggtact ttgagagacc ccaggacagg agacagggag gctgagattg gcatgttgtc
 601 tgctgcagtt atttgccagC Gacacactct ttcCGtccaa actaacttct ctgcctcaag
 661 gacagggaga ctctgccttt caacctgaga gaaaccagga ctctcagctt taatgaaaat
 721 tggacttagg gtggggcagt ggagactttt cacagctatt gtttagctga tgaagcagat
 781 gcttctccat ctttggagcc tgtcttcatt acctgtggac ctcatcttta tcaacccaga
 841 gcacacttgC Gtctctctat tttggctaaa caccaaacag ctgaggctgg tactgtaaaa
 901 ctttccctcc aaatgccccc cctCGtcttc ctctattaga gatctggatc acaaccctca
 961 aaaaccatgt cccttatgcc acctgagtag atggtttgat gattaattag gcacagatgt
1021 gacactgggg gggtctcaca atggcctgtg ggtcacatgc tactttcctt ttcatttca
1081 tcagcaacag ctgccttaaa gccagttaag actgtggtcc tagtctCGca ccctggggct
1141 cctgctgggg tgggtgaggg gaacacccca ttaagctggg ggaactgggg ctgccaccag
1201 ggggCGCGag gggccttCGc cCGagaagag gggtgggcag gtgcctccag CGgagaaggg
1261 CGcCGtggcC Ggaggcacag gtctcccCGg tgccacttca agtgagttCG aggaagtacc
1321 tgggatcttt gatctaaCGC Gaaaggcctt cccagtgacc tcttgagggc tgagaaccca
1381 ctccctccac ctctagtcca CGgctttgcc actccagggc cCGaggttaC Gtttgctgct
1441 ggggatttga caaacccaaa gcctctctgg tttcaccact ggctccttag aatcagacat
1501 ctgttctgaa tgacacttat gtgagtcagg ggctgaggaC GtgatcctCG aagtgtggtc
1561 cccagactgg ctgtatcagt gtCGgcatcc cccaggacct ggttggaaat gcatattctc
1621 aggccctact ccagacctct taaatctgag actggggctg CGgggagCGc catctgtgCG
```

FIG. 8A

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Applicants: Sukumar et al.
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(SEQ ID NO:104 CON'T)

1681 ccactatcct tgtgggtgga ccaggagtCG gttCGagggt gctcccactt agaggtcaCG
1741 CGCGgCGtCG ggCGttcctg agacCGtCGg gctccctggc tCGgtcaCGt gggctcaggc
1801 actactcccc tctaccctcc tctCGgtctt taaaaggaag aaggggctta tCGttaagtC
1861 Gcttgtgatc ttttcagttt ctccagctgc tggcttttg gacacccact ccccCGccag
1921 gaggcagttg caagCGCGga ggctgCGaga aataactgcc tcttgaaact tgcagggCGa
1981 agagcaggCG gCGagCGctg ggcCGgggag ggaccaccCG agctgCGaCG ggctctgggg
2041 ctgCGgggca gggctggCGc cCGgagcctg agctgcagga ggtgCGctCG ctttcctcaa
2101 caggtggCGg CGgggCGCGC GcCGggagac ccccctaat gCGggaaaag caCGtgtcCG
2161 catttagag aaggcaaggc CGgtgtgttt atctgcaagc cattatactt gcccaCGaat
2221 ctttgagaac attataatga cctttgtgcc tcttcttgca aggtgttttc tcagctgtta
2281 tctcaagaca tggatataaa aaactcacca tctagcctta attctccttc ctcctacaac
2341 tgcagtcaat ccatcttacc cctggagcaC Ggctccatat acataccttc ctcctatgta
2401 gacagccacc atgaatatcc agccatgaca ttctatagcc ctgctgtgat gaattacagc
2461 attcccagca atgtcactaa cttggaaggt gggcc

FIG. 8B

Unmethylated 288 BP

G ggTGtttttg agatTGtTGg FUM 21 BP AT 60 (SEQ ID NO:85)

TG agttgTGaTG ggttttgg (SEQ ID NO:86)

ccaaaacc CAtCAcaact CA RUM 20 BP AT 58 (SEQ ID NO:87)

Methylated 181 BP

agagtaggCG gCGagCGt FM 18 BP AT 60 (SEQ ID NO:88)

CGggaaaag taCGtgttCG t (SEQ ID NO:89)

a CGaacaCGta cttttccCG RM 20 BP AT 60 (SEQ ID NO:90)

FIG. 8C

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
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HIN-1 nucleotide sequence Genbank Accession No. AY040564 --(SEQ ID NO:120)

CTTTGCTCTCCATCTGTCATACTTCTGCAGGTGACAGACGAGTGAGGACATTTAGAGAAACTCAG
GAACAAACCAGGCCCATCCACTGGCGTCGAGGCTAGTTTCGAAGACAGAAAAACGCCCCACTTC
TGTTTGCACTGTGGCTGCCTGTGGCCCGGCCGGGGAGGCGGCCGGGAGTGAGGCCTGATCGTCCC
TGGCGCCTCCACCTCCCCAGGCGCAGAAGGCGCCCACGAGGACCCCCAGTGCCCGACGTTGCCAC
GGTCTGGGATCAGAGGCACGGGACCAGGGAGCCAGGAACTGCGCCGCCCCGCCCTGCCTGGCGCG
AGGAAGCTCCCTCACCGGGCCAGCCTGCAGGGGGNGCTTCTCTTCCCTTCTTTCCCCCCCCTTTCC
GTCCTCTCTCTCCTCCTCCTCTCCTCCTCTTGTCGTATCTTTCTCTCCCTGTCGCTGTCTGTTCTTCCT
CTCCCTGCTGCTGCCGTCGGTTCTGTCTCTTCTCTGTCGTTCCCTTCTCCCCTTCGCCCTCGTGTCGC
TGCTTATATAAGTGAGAAAAAAAAAACCAAAAAAACAGACATGTTGCTAAGATAGTCTTTCCCAT
TATTTTCTTATTTCAAACGTGATCTGGTCTTCCACGCCTCCGCTAGCATTAACAAAAACAAAACGT
CACAGTGCTGGCCGCCGTATCTCGGATAGCCATTTTCCGGCCTCCAATCCCAGTCCAATGGCCCGT
GGGGACCCCATTCCCAAGTTTCCACTGTCGGAATCTTTCTATGACCAGGTACCCAGTTCTTGCCCT
CCCCTGCCCTGTCCTGTCTTCGAGGGAAGCTCCCCTCACCCGGCCCAGCCCTGACGGGGGCGCTGG
GGTCAGACCGCAAAGCGAAGGTGCGGGCCGGGGTGGGCCTCGCGGAGACAAAGGCCGGGCCTGC
CTCTCTCAGAGGGCCCCAGCGCCTGCCAAGAGGAAGTCCTCGAGGCCCGGGCAGGGAAGGGGGC
ACGGGCTTCCCACGGCCCGCCGGCCGCAGCAGGAAGTTGGCCAGGGCACGGCCGTGAGCGGAGC
GGGCAGGGCTTTCTCAGGAGCGCGGGCGAGGCCGGCGCTGGAGGGGCGAGGACCGGGTATAAGA
AGCCTCGTGGCCTTGCCCGGGCAGCCGCAGGTTCCCCGCGCGCCCCGAGCCCCCGCGCCATGAAG
CTCGCCGCCCTCCTGGGGCTCTGCGTGGCCCTGTCCTGCATGCTCCGGTGAGCGCCCCGGGCTCCT
GGCGCGCACGGTGGGCCTGAGGCCTCGGCGCCCCGTGCGCCCCCGCCGCTGCCTGCGCCGATCGT
GGATCCCAGGTCCTTCCAGCCTCGCCCGGCGCCCAGAGGGCTCCGCCACCCCGGGGCCCCGCGCC
TGCAGCCCGCGGCCTCCCCCTCTCAGGGCTGTCTCCAGCCTCGTGCCGGGATGGAGGCCGCCCCTG
GCCTGGGGACACCCGTCTGCCCCCCGTCTGGAGACCGGCTCCTCATCCTGCAAGGCGCAGCGCGA
GTGTCCCCTCCCTTGGGGGCCTGTCCCGGACCCTGCACAGAGTTCACCGGTCCTTCCGCCACCCTC
AGGCCACTCCGGTGACCCTGCAGCGTCTCCTGGCGGGGCCGCCTCCCCAGACCCGCCTGTGTCCC
GGGGGCTCGCACCTGGCAGGCCTCGGCGCAGGAGGGAGGGGCGGTCGGGGAGCCGGGCAGGGCG
CGACGGTTCCTGGGCGCCTCCCGCGGGGGCGCGTCCTGGACCTGCCTTCTGGGGACCCCGGCGCG
CAGGCGGTGACCCCTCCCTGTTCGCTTGCA

FIG. 9A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
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HIN-1 SEQUENCING PRIMERS

Forward: 5'AGGGAAGtTttttTtAtttGGtt 3', 23 bp, 56 (SEQ ID NO:111)

Reverse: 5'GTGGtttTGTttTGtATGtTttGGTG 3' (SEQ ID NO:112)

Reverse: 5'CACCGAAACATACAAAACAAAACCAC 3' 60, 26 bp (SEQ ID NO:113

HIN-1 External primers 209 BP (-213 to -39)

Forward (2): 5'-GTTTGTTAAGAGGAAGTTT- 3' (SEQ ID NO:114)

Reverse: 5'-CACCGAAACATACAAAACAAAACCAC- 3' (SEQ ID NO:115)

Primers for Methylated HIN-1:

Forward: 5'-GGTACGGGTTTTTTACGGTTCGTC-3', 24 bp, 60 (SEQ ID NO:116)

Reverse: 5'-AACTTCTTATACCCGATCCTCG-3', 22 bp, 62 (SEQ ID NO:117)

Primers for Unmethylated HIN-1:

Forward: 5'-GGTATGGGTTTTTTATGGTTTGTT-3', 24 bp, 62 (SEQ ID NO:118)

Reverse: 5'-CAAAACTTCTTATACCCAATCCTCA-3', 25 bp, 68 (SEQ ID NO:119)

FIG. 9B

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
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Nucleotide sequence of RASSF1A promoter (SEQ ID NO:121)

17701 tcagcaaacC Ggaccaggag ggccagggcC Ggatgtgggg accctcttcc tctagcacag

17761 taaagctggc ctccagaaac aCGggtatct cCGCGtggtg ctttgCGgtC GcCGtCGttg

17821 tggcCGtcCG gggtggggtg tgaggagggg aCGaaggagg gaaggaaggg caaggCGggg

17881 ggggctctgC Gagag**CGCG**c ccagcccCGc cttCGggccc cacagtccct gcacccaggt

17941 ttccattgCG CGgctctcct cagctccttc cCGcCGccca gtctggatcc tgggggaggC

18001 Gctgaagt**CG** gggcc**CG**ccc tgtggccc**CG** cc**CG**gcc**CGC G**cttgctag**C G**cccaaagcc

18061 ag**CG**aagca**C G**ggcccaac**C G**ggccatgt**C G**ggggagcct gagctcattg agctg**CG**gga

18121 gctggcacc**C G**ctggg**CGCG** ctgggaagg cCGcaccCGg ctggagCGtg ccaa**CGCG**ct

18181 g**CG**cat**CGCG** **CG**gggcac**CG** **CG**tgcaaccc caca**CG**gcag ctggtccctg gc**CG**tggcca

18241 c**CG**cttccag cc**CGCG**gggc c**CG**cca**CG**ca ca**CG**tggtg**C G**acctctgtg g**CG**acttcat

18301 ctgggg**CGtC GtgCG**caaag gcctgcagtg **CGCGCG**tgag tagtggccc**C GCGCG**ccta**C**

18361 **G**agag**CG**gaa ggggcagcca aggggc**agCG** cagt**CG**c**CGC G**ggtcaagt**C GCG**gcagagg

18421 gggt**CG**g**CG**g ggacagctcc **CG**aggactag gtc**CG**ttact tt**CG**ccccat **CG**ctgaagag

18481 tg**CGCG**aaaa tggtttatcc cttgt**CG**cac tccact**CG**ta tctgggccac agatgagcag

18541 aggtggctgc ttatatgtaa aaata**cg**ctg attttaagtt tcttatcttt aaaatgcctt

FIG. 10A

Title: ABERRANTLY METHYLATED GENES AS MARKERS OF BREAST MALIGNANCY
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SEQUENCING PRIMERS FOR RASSF1A

External Primers 294 BP

gggagtttgagtttattgagt RASSF1 ext. F (SEQ ID NO:122)

acccctaactaccccttc RASSF1 ext. R (SEQ ID NO:123)

Internal MSP Methylated 160 BP

gttggtattC GttgggCGC RASSF1 FM (2) (SEQ ID NO:124)
GcaccaCGtataCGtaaCG RASSF1 RM (SEQ ID NO:125)

Internal MSP Unmethylated 180 BP

ggtTGtattTGgttggagTG RASSF1 FUM (SEQ ID NO:127)
ctacaaacctttaCAcaCAaCA RASSF1 RUM (SEQ ID NO:128)

FIG. 10B

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FIG. 11 Multiplex Methylation-Specific PCR